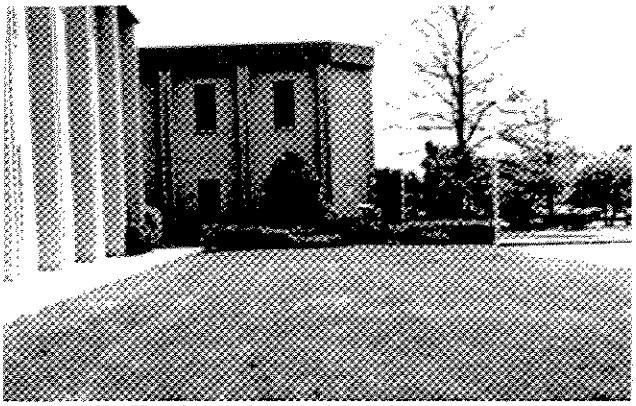
NATIVE PLANT LANDSCAPING



BEFORE: *The front of the building is dominated by mown lawn and a few masses of evergreen trees and shrubs.*
U.S. Fish and Wildlife Service Building
Annapolis, Maryland

AFTER: *Native trees, shrubs, and flowers provide a colorful entrance to the building & attract butterflies and birds.*
U.S. Fish and Wildlife Service Building
Annapolis, Maryland

Case Study: Native Plant Landscaping

Native plant landscaping on school grounds is a relatively new concept although some native plants can be found on most school planting plans. A number of organizations are promoting native plant landscaping for public institutions, corporate and commercial sites, residential communities, and individual homes. Foremost among the local programs endorsing the environmental benefits of native plant landscaping is BayScapes, sponsored by the U.S. Fish and Wildlife Service (USFWS) and the Alliance for Chesapeake Bay. School children have helped install most BayScapes demonstration projects including those at the Maryland Coastal Bays office near Assateague on the Eastern Shore and at Fort George S. Meade in Anne Arundel County.

The overall goal of the BayScapes program is the reduction of nutrient pollution in the Chesapeake Bay. The program recognizes that site development decisions affect water quality in the streams and rivers of our State and ultimately in the Chesapeake Bay. The objectives of BayScapes landscaping are relevant to school sites:

- save money and time by using low maintenance regionally native plants
- reduce the need for fertilizers, herbicides, and pesticides
- conserve water
- save energy and reduce utility bills
- enhance the quality and durability of landscaping
- attract desirable wildlife
- increase enjoyment of the property

The BayScapes installation at the U.S. Fish and Wildlife Services office in Annapolis is an excellent example of what might be accomplished at a school site. The original landscape featured a large panel of grass, with a number of evergreen trees and shrubs lining the walkway to the building entrance. To save costs, most of the original plants were left in place when the native plants were added. As with most BayScapes projects, the first aim was to save energy by reducing mowing and chemical lawn treatments. Thus, much of the grass in front of the building was eliminated and replaced by native plants that will provide a more diverse landscape and attract wildlife.

The new landscape, designed by Marie Erb, a member of the Maryland Native Plant Society, features the lovely spring and summer flowers of serviceberry, sweetbay magnolia, and redbud trees. Native shrubs like the blueberry, arrowwood viburnum, and winterberry holly offer fruit for birds. The garden is colorful from May through October with the blooms of native perennials including blue phlox, coreopsis, purple coneflower, black-eyed susan, gayfeather, butterfly weed, and aster. The little bluestem, a native meadow grass, grows to 4 feet tall and its graceful green stalks turn amber in the fall and remain attractive all winter long.

According to Britt Slattery of USFWS, the advantages of BayScapes go beyond the environmental benefits and attractiveness of the plantings. Not only does a BayScape look a bit different from a conventional ornamental landscape, people react differently to it. "People become involved," she notes. Staff members pull a few weeds as they pass by on their way to or from work, bring in stepping stones to add to the garden, and learn about plants that they can use at home. If someone notices changes in the garden, they spread the word that something new has bloomed or that a new bird or butterfly was seen. Imagine students arriving at school excited by sighting an oriole eating the blueberries, by discovering the first blossom on a magnolia tree, or by spotting a monarch butterfly perched on a coneflower.

The new planting cost $5,000.00 and was installed by a professional contractor, Buzzuto Landscaping. According to Slattery, the installation, if done by volunteers would have cost approximately half that amount for plants, mulch, and ground preparation.

For more information about BayScapes, contact:

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Annapolis, MD 21401
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Introduction

A schoolyard in Maryland should look different from a schoolyard in New Jersey. Similarly, a school site in Chestertown on the Eastern Shore should have a distinct character from one in Frostburg at the edge of the Appalachian Mountains. Landscaping with native plants can help provide that special identity. By selecting native plants for our school grounds, we link the schools with the landscape of the region reinforcing seasonal cycles and colors. We note the passing of the year as we watch the sequence of flowering in the early spring or the gradual coloring of the forest in the fall. Native plants reinforce our sense of place, a recognition of where we are. By using native plants we are demonstrating that there is an appropriate regional expression for design, whether it is through architecture or landscape architecture.

"By selecting native plants for our school grounds, we link the schools with the landscape of the region preserving and reinforcing the region's ecosystem."

Imagine it is spring at a school on the Eastern Shore. A large island in the parking lot sports a cluster of red maples and sweetgums underplanted with arrowwood viburnums and highbush blueberries. Flanking the front entrance is a pair of American holly and hedges of bayberry and inkberry line the entrance walk. A pure stand of loblolly pine buffers the school from the neighboring property. The pines provide a backdrop for the large white flowers of the sweetbay magnolia. In the drainage ditch along the road are black willow and large masses of silky dogwoods. The students are studying Native American culture and learning that their arrows were made from twigs of the viburnum, and young willow branches were woven into baskets.

Now, travel to a school in the Hagerstown Valley. It is fall and the entrance driveway is lined with sugar maples that are ablaze with yellow, orange and red leaves. A hedgerow along the property boundary is reminiscent of the local agricultural landscape. Birds

enjoy the fruits, seeds and nuts of the serviceberry, blackhaw, cranberry bush viburnum, and hophornbeam in the hedgerow. The landscape is made colorful by the red foliage of the glossy sumac that covers the slopes near the athletic fields, and by the clear yellow leaves of the witchhazels that are massed at the corners of the building. In the spring, a local farmer will be visiting the school to show the children how to tap the maple trees for syrup. They will learn that a few generations ago families might have made jam from the berries of the viburnum and treated skin problems with witchhazel lotion.

Environmental Enhancement

The importance of environmental enhancement of public property is recognized on a federal level and supported at the state level in Maryland. In April 1994, the White House issued an Executive Memorandum on Environmentally Beneficial Landscaping. It recommended that federal properties be planted to complement and enhance the local environment using regionally native plants, minimize adverse effects on natural habitats, and promote the use of plants that conserve water and energy. With the publication of this manual, the Maryland State Department of Education is recommending similar goals for the landscaping of school properties.

Understanding what designates a plant as native is important to the discussion of native plant landscaping. Native plants are those which occur naturally in the landscape of a region or locale. They are sometimes defined as the plants that existed in that landscape prior to the arrival of European settlers. A native plant community is an assembly of trees, shrubs, and groundcovers that have arrived in a certain location and survived due to their adaptability to the landform, microclimate, solar aspect, soil, and water. Protecting and planting native species preserves and reinforces the region's ecosystem. In an ecosystem there is a mutually beneficial relationship between plants and animals. Wildlife is generally dependent upon native plants within its territory for food and cover. In turn, native plants depend on wildlife for pollination. Animals disperse seeds for the continued propagation of plant species. Thus, planting native species contributes to the continuity of this chain of life.

"A planting plan featuring native plants should be part of a comprehensive landscape design that includes forest conservation, tree preservation, landscaping, and the creation of schoolyard habitat gardens."

Contribution to Educational Programs

The landscaped areas of a school site can provide the stage for numerous educational programs. Plantings can be a source of inspiration for art, writing or other creative activities. They can be used in an environmental science curriculum to teach classes in biology, environmental management, wildlife habitat, pollution prevention, and many other related subjects. Children learn important aspects of ecology when they go outside for lessons that include the use of native plants. They might count how many living creatures they can find in a square meter of lawn, meadow, forest, or garden. They can measure the temperature on a sidewalk and compare it to the temperature on the grass and under a tree. Using the schoolyard as a classroom requires the commitment of administrators and teachers to integrate the outdoor environment into the education program. Bringing students outdoors can result in active learning, an exciting experience for children and teachers alike.

Planning, Design, and Construction

Planning for native species at a new school site first requires analysis of the site conditions and an inventory of existing plants. The Maryland Forest Conservation Act requires a natural resources inventory and a forest stand delineation report for most development proposals. A plant species inventory identifies what species are present at the site, but it can also be used to determine what species might be absent or under-represented on the site. A planting plan featuring native plants should be part of a comprehensive landscape design that includes forest conservation, tree preservation, landscaping, and the creation of schoolyard habitat gardens. Landscaping

with native species is not a substitute for preserving native forests and specimen trees. Before deciding where new plants should be located, decisions should be made about saving existing plants and, when possible, transplanting them. Careful planning will minimize destruction of native habitat. Typically, certain site areas are landscaped as part of schoolyard enhancement: the vehicular entrance to the site, pedestrian entrances to the building, courtyards, parking lots, drop-off areas, and the site perimeter. Plants with ornamental characteristics -- showy flowers, attractive fruit, colorful foliage, interesting bark, or handsome form -- are often used to frame or accent an entrance. Planting should be used to improve the microclimate by using large trees to shade the building, pedestrian pathways, play areas, roadways and parking lots. Planting may be used to deflect harsh northwest winds. The site perimeter may be planted to soften the view from the road or to screen the school from neighboring residential or commercial properties. Each situation offers an opportunity for adding native plants to the landscape treatment.

Site Planning Considerations

Native plant landscaping involves more than just preparing a planting plan as part of the construction drawings for a school site. Site planning decisions affect decisions about plant selection and planting design. Taking plant needs into account during the planning phase can help ensure healthier plantings and can make maintenance easier. The following are a few important practical recommendations that should be considered during the site planning process.

Orientation - Consider orientation during site planning and plant selection. Ornamental planting is often concentrated at the entrance to the building. An advantageous orientation for most plant materials is an eastern or southeastern facing site. Planting on the southeastern side of the building provides morning sun, shelter from harsh northwest winds, and protection from the hot drying western sun. Most plants, whether sun loving or shade tolerant, will adapt to this location. An east-southeast facing entrance is an ideal orientation for plantings, and it is also ideal for the activities associated with arrival at the school. The building is bathed in sunlight rather than hidden in shadow; the morning sun means that rain, ice or snow will begin to dry or melt faster. This is also the best orientation for a children's garden. The least desirable location for gardens and ornamental landscape plantings is the northwest side of the building. These areas are in the shade much of the year and subject to drying winds and hot late afternoon summer sun. Avoid placing major entrances to and exits from the building in these locations, particularly if doors remain open for extended periods as children move to and from outdoor play areas. Plantings at northern and northwestern sides of the building should be carefully selected for tolerance to climate conditions.

Water - Provide hose bibs as a source of water for planting areas. The area around the building will generally be hot due to radiant heat from the storage of the sun's energy in masonry walls, therefore evaporation of water from plants around the building is likely. If water is handy, it is much more likely that watering will occur.

Foundation Planting - Pay special attention to plantings immediately adjacent to the building. This is often the least desirable environment for planting. Large buildings do not need conventional "foundation plantings." They do not have foundations to conceal. Concentrate plantings in groups rather than in long lines all along a face of the building. In areas where there is no planting, consider providing a narrow paved mowing strip to make maintenance easier along the base of the building (See Figure 3 for an example of a mowing strip). Avoid creating narrow planting areas between the building and a pedestrian walkway, as these areas are subject to compaction during construction, dry out quickly, and suffer heat build-ups from the adjacent building.

Planters - Do not design small areas of planting within a large paved area. Plants that are surrounded by paving on multiple sides have a high likelihood of being trampled by students. As with narrow planting strips adjacent to the building foundation, these areas will suffer from the heat and compaction associated with the adjacent paving. Small planting "cutouts" within paved areas often have inadequate drainage and

insufficient root space for good plant growth. Consider raised planters for ornamental plantings near the building entrance or in special pedestrian areas. The potential for trampling small shrubs and flowers will be reduced if plantings are raised above the level of the walkway. Planter heights can range from curb height (6 inches) to seating height (18 inches). The size of the planting area must be sufficient to support the growth habit of the plants within it. Larger is better.

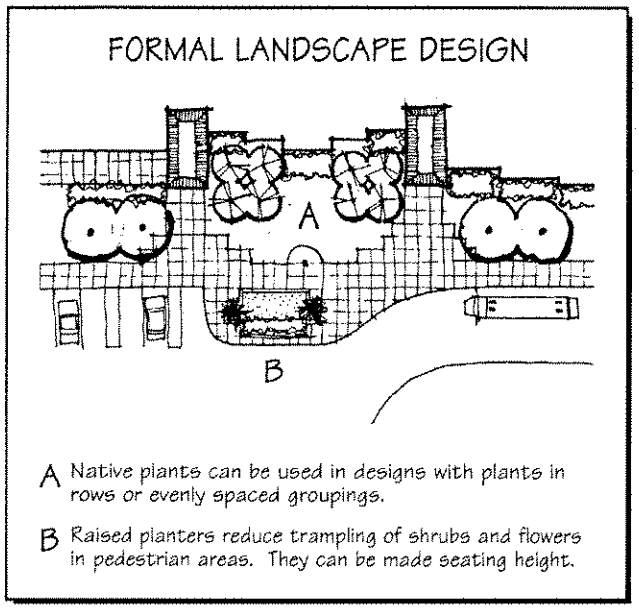

Figure 1

Planters are excellent areas for student planting projects to enhance the appearance of the school. Soil within planters is seldom subject to compaction by machines and it is easier to work the soil in planters than it is to excavate the soil near building or pathways (See Figure 1 for an example of a raised planter at a school entrance).

Circulation - Avoid using plants to control circulation. If a plant is in the way of a pedestrian route, it will not deter a student. The plant will get trampled. Thorny plants such as nonnative pyracantha or barberry are not a solution. They send a message (keep away or be hurt) that is inappropriate for a school environment. To define a special use area such as a playground or garden plot, and to keep traffic from cutting through, it may be necessary to build a low wall, fence, or berm. Plantings can make these features more attractive, but plants alone will seldom be enough to stop trespassers.

Storage - Provide storage areas for gardening and plant maintenance equipment. The storage should have access from outside of the building.

Landscape Design and Plant Selections

Selecting plants for a school site involves decisions about the visual characteristics of the plants (the artistry of design) and the adaptability of the plants to the site location (plant physiography). Designers seeking the right plant for the right place should make their selection based on the plant's form, color, or texture, and on the plant's place in the local ecosystem. Planting guides and nursery catalogues should be cross-referenced to determine if a plant is native or exotic (a plant from another country or another region of the United States), and to learn the wildlife benefits, ornamental characteristics, and cultural requirements of the plant being specified. As mentioned above, native plants contribute to the unity and harmony of the natural scene within any landscape. But the advantages of using native plants for ornamental landscaping go beyond their regional appropriateness. Native species provide a rich palette of plants with distinctive and desirable sensory characteristics. Prime examples include the multicolored shredded bark of the river birch, the lustrous leaves of the American holly, the delicate white flowers of the shadblow, the fragrance of the spicebush, and the profuse colorful berries of the nannyberry viburnum.

A commitment to using native plants in the landscape does not require that only native plants be specified. There may be cases when nonnative or cultivars of natives are selected for availability, design characteristics, or special site conditions. But a concerted effort should be made to include natives in the school plant palette.

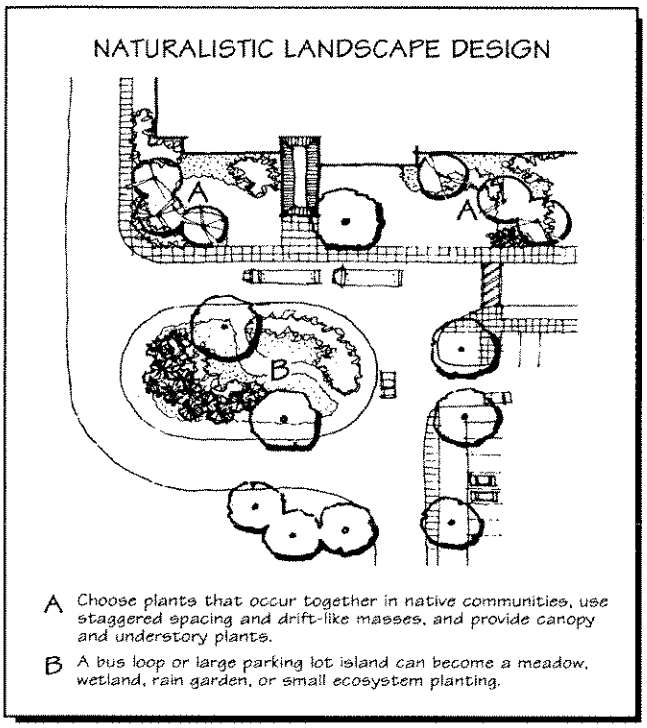

Figure 2

There are two different design approaches to incorporating native materials in a planting design: formal landscape design and naturalistic or ecosystem-based design. Both are valid approaches for the use of native plants on school sites (See Figures 1 and 2).

Native Plants and Formal Landscape Design - The first approach is to substitute native plants for some or all of the plants in a traditional design scheme. Formal rows, even spacing, or ordered groups of plantings may be appropriate to frame an entrance, define circulation through a parking lot or along a path, or create a strong geometry that echoes architectural massing. Native plants can be used effectively in such a design pattern.

Native Plants and Naturalistic Design - The second approach is to use native plants within a design structure that attempts to recreate plant communities or associations found in nature. A naturalistic or ecosystem approach usually employs staggered spacing and mixes species in drift-like plantings. In a plant scheme aimed at mimicking native communities, plants can be spaced closer together than is recommended in many textbooks or landscape ordinances. This close spacing would reduce the tendency to mow under and between trees and it would allow the plants to close their canopies to make an interconnected mass. A planting plan influenced by native assemblies would use plants in masses, locating them in places that approximate their natural habitat (upland, wetland, streamside, woodland, etc.).

Substitute Natives for Exotics - It is a relatively easy process to substitute native trees for exotic trees in a landscape palette (See Figure 3). There are numerous large shade trees and small ornamental trees suitable for Maryland sites that have ornamental qualities equal to those of nonnative trees. Most have handsome forms and foliage. However, a few native trees may have maintenance concerns that should be addressed. For example, the native sweetgum (*Liquidambar styraciflua*) with its handsome star-shaped leaf and multicolored fall foliage would be appropriate in a grove, as part of a wetland planting, or in a landscape buffer. However, the native sweetgum often produces a large crop of fruit capsules that could be undesirable on small islands in parking lots, near a storm drain, or along a driveway. A non-fruiting cultivar should be selected for such locations. Ash *(Fraxinus)* is a native

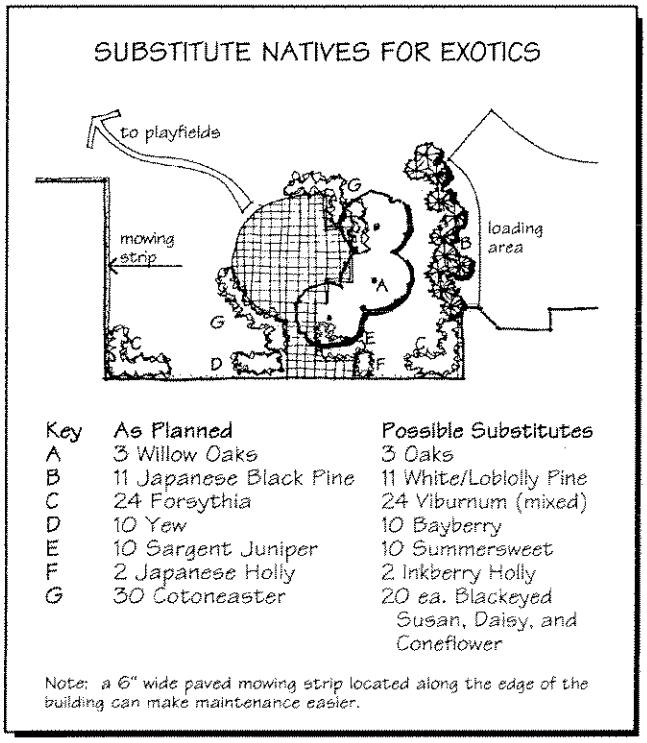

Figure 3

species that tolerates dry or urban conditions. The native varieties produce seeds that have moderate wildlife value. The prolific seeds of this tree can propagate other trees and contribute to future forests. All too often a seedless variety is specified so that natural regeneration of the species cannot occur. Again, the maintenance issue will dictate whether the wild/native or the cultivar will be selected. In a parking lot, the seedless ash or a different native species may be recommended.

Using native shrubs provides a different landscape character than a planting design that features exotic or nonnative plants. Conventional ornamental plantings often rely heavily on exotic broadleaved and needle evergreen shrubs for a year-round green appearance. Certain frequently used exotic plants that are tough and hardy evergreens (junipers, yews, siebold euonymus, cherry laurel) have minimal seasonal change. Many of these nonnative plants have inconspicuous flowers, produce no fruit, and have little wildlife value. By contrast, many of our native shrubs are valued for their showy flowers, profuse fruit, colorful or interesting twigs, attractive fall foliage, and wildlife benefits. Most of the native shrubs suitable for schoolyard planting are deciduous and therefore change their characteristics with the seasons. A few natives are suitable as specimen plants, but most are best used in masses. Because many native deciduous shrubs are coarsely textured when they drop their leaves, a mixture of native and imported plants that includes evergreens or finely textured plants may be desirable for landscaped areas around the entrance to a school building.

Reforestation: The creation of a biological community dominated by trees and other woody plants containing at least 100 trees per acre with at least 50% of those trees having the potential of attaining a two inch or greater diameter within seven years.

Afforestation: Establishment of a tree cover on an area from which it has always or very long been absent.

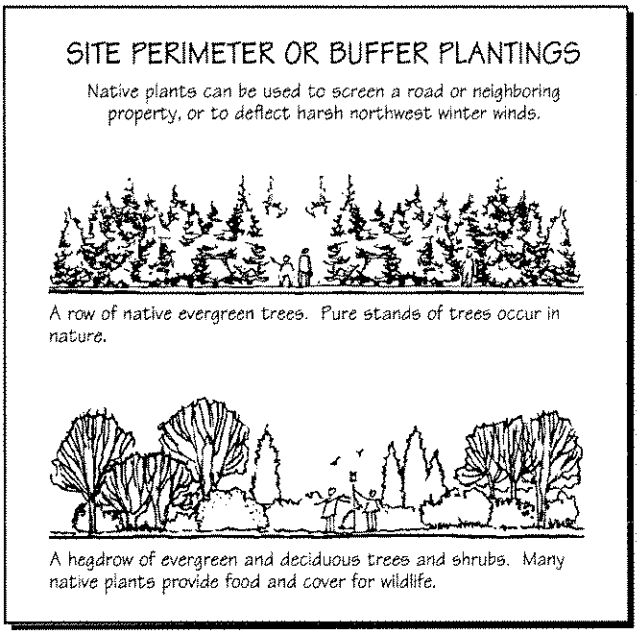

Figure 4

Perimeter or Buffer Plantings - Oftentimes a perimeter buffer is needed to screen the school from a road or from neighboring properties. Dense plantings also may be needed to buffer outdoor use areas from harsh northwest winter winds. The conventional planting solution might be a row of evergreen trees. A monoculture of a native evergreen is an acceptable solution; after all, pure stands do occur in nature. A more interesting approach would be planting a hedgerow. The hedgerow could be a mix of evergreen and deciduous material that emphasizes plants having fruits and nuts for wildlife. Deciduous plants can serve as effective buffers. Deciduous plants and their leaf litter have value for noise reduction and water protection. Planted closely together, hedgerows can provide dense screening in the summertime as many deciduous shrubs grow to a height of 12 feet in a few years. We are used to having more visibility into sites in the winter and accept, even enjoy, a peek into a hidden landscape once the trees have dropped their leaves (See Figure 4).

Native Plant Landscaping and the Forest Conservation Act - Many school construction projects are required to reforest or afforest the school site in compliance with the Maryland Forest Conservation

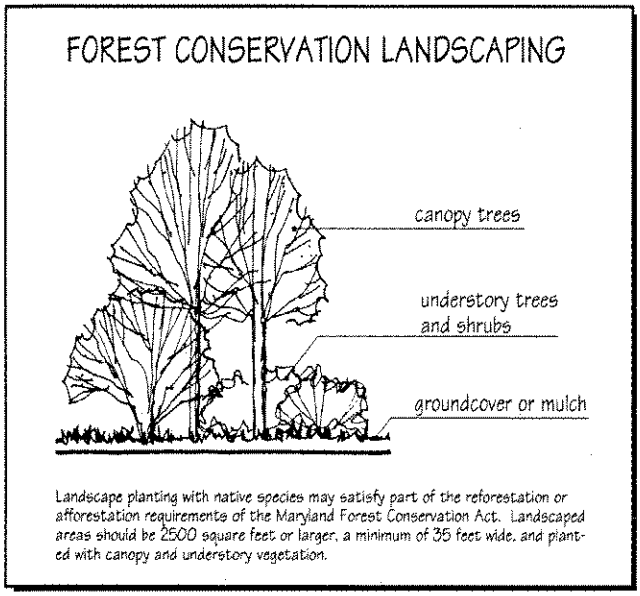

Figure 5

Act. Using naturalistic ecosystem-based landscape design may help satisfy the requirements of the forest conservation act. The forest conservation act allows certain kinds of landscaping to be counted toward the reforestation obligation for a site. Reforestation areas must be at least 2,500 square feet and 35 feet wide, and they need to have canopy, understory, and ground cover layers. In most cases grass is not considered an acceptable ground cover (See Figure 5). Thus, properly designed, a perimeter landscape planting could comply with the requirements of the Maryland Forest Conservation Act.

Site Suitability and Plant Selection

When selecting native trees and shrubs for school site landscaping, one approach is to look at a nearby forest to identify suitable species for planting. If the site conditions after construction of the new school are radically different from those of the adjacent area, this may not be the best approach. Massive grading to create level areas for a large building, playing fields, and extensive paved court areas may have severely disrupted the previous site conditions. Land that may have supported a native forest ecosystem has now been transformed into a very different landscape. The change to the soil is the most important factor affecting plant growth. Prior to development of the school site, the soil may have had the organic matter, pH, aeration, and moisture holding capacity needed for good forest growth. After construction, most sites are characterized as "urban soils" because the earth has been disturbed, mixed, excavated, or filled over. Urban soils often have a bulk density or compaction that far exceeds that of the site prior to construction. As a result, there is a lack of air in the soil, water will percolate through the soil much more slowly, and roots will have difficulty penetrating the soil. The pH of the soil is also affected by construction. The area around the building is usually the most severely disturbed. Building specifications usually call for a backfill of crushed gravel along the foundation wall. At many sites, construction debris finds its way into the backfill immediately adjacent to the building. These conditions, and leaching of the materials in the foundation slab, can contribute to an alkaline soil condition. Although most specifications call for stripping, stockpiling and re-spreading the existing topsoil of a site, this is seldom accomplished. After construction, most school sites have little, if any, topsoil or organic matter to provide the needed nutrients for plant growth. Thus, the site is no longer innately suited for the growth of many of the plants that previously inhabited the site.

For guidance about planting a site that has been severely disturbed by construction activities, we can look to sites that have undergone natural disturbances for clues to suitable plant use. A school site after development may have much in common with a site denuded by severe weather, pest infestation, or fire. Pioneer plants that invade a site after disturbance, or native plants that grow on dry open landscapes may be more appropriate than the species that made up the forest canopy and understory that once occurred on the site. Consequently, in cases where the site has been severely altered, it may be necessary to choose plants that are suitable to disturbed environments. Selection of plants that adapt to hostile environments should not be a substitute for preparing a site so that it will support healthy plant growth. Plants grown in compacted urban soils, even the most adaptable ones, will not grow as fast nor have as attractive a form as plants grown in a more suitable soil. Preparing the new site so that it will support the forest plants typical of the region is preferable to selecting plants that will have a better chance at surviving in an inhospitable environment.

Finally, plant selection must consider the cold hardiness of the plants. In Maryland, the Coastal Plain is in zone seven, the Piedmont region is in zone six, and the Appalachian Highlands in zone five.

Recommended Plant List

For successful school site planting, the plant palette should consist of species that are available from local suppliers, easy to establish, insect and disease resistant, have a high survival rate, and are tolerant of drought and compaction. The plants selected should have both wildlife and ornamental value. Appendix C is a list of plants that meet most of these criteria. The list is not a comprehensive compilation of native plants nor does it include hard-to-find or hard-to-establish plants. It focuses more on sun tolerant conditions, and therefore, it omits some forest plants that prefer the cool shady locations (hemlock, black gum, beech, hickories, azaleas, rhododendrons, mountain laurel). The strategy for schoolyard planting is very different from that for home landscaping. The flowering dogwood may be the most ornamental of our native understory trees, but it seldom survives or grows well at a school site unless it has good growing conditions (rich, well-drained soil) and adequate maintenance (watering, treatment for anthracnose). The list also avoids plants that may have high wildlife value but that may be messy, short lived, disease prone, or that may have poor form (black cherry, box elder). Many trees suitable for a reforestation planting will not be found on the list as it focuses on native plants for ornamental landscaping. The list does include trees and shrubs that are tolerant of wet soil or inundation, but it does not provide a comprehensive list of plants suitable for creating wetland, pond, or stream habitat areas. Plants are listed by moisture zones in the Wetland Section on page 46. Native perennial flowers and grasses should be considered an integral part of a school landscape planting scheme. The list only includes woody plant species, therefore other publications should be sought for recommendation of native perennial flowers and grasses. Perennials may be specified for new construction, but often they are planted as a part of schoolyard enhancement projects undertaken by parents or teachers who are committed to maintaining these plantings. Black-eyed Susan (the state flower), purple coneflower, and asters are a few reliable native perennials that do well for mass plantings in high visibility areas. All are suitable choices for planting during new construction.

Plants to Avoid

Invasive exotic materials are non-native plants that pose a threat to native plant communities because of their vigorous growth habit, prolific fruit, or because they may provide such dense shade that they prevent desirable native plants from germinating. Some of these undesirable plants appear on published lists of ornamental plants for landscaping. A list of exotic invasive species appears in the 1991, 1995, and 1998 editions of the Maryland Forest Conservation Manual. The list includes Norway maple, multiflora rose, honeysuckle (most species), autumn olive, Russian olive, Chinese privet, winged or burning bush euonymus, some buckthorn species, oriental bittersweet and many others.

Construction and Installation

Appropriate specifications for site preparation and plant installation area are essential to the success of any schoolyard planting. Soil specifications are as important as the selection of suitable plant material. If the soil is not prepared properly to support plant growth, plant survival and long term growth will be jeopardized. Specifications should include a requirement for soil testing. Landscaped areas should be aerated, organic matter should be tilled into the soil and the pH should be adjusted to the appropriate range prior to planting. The Landscape Contractors Association of Maryland, the District of Columbia, and Virginia publishes guidelines for site preparation, plant installation, and maintenance. These guidelines are an excellent model for the development of landscape specifications.

Long Term Maintenance

Native landscape plants, if chosen appropriately should require less maintenance than conventional ornamental landscaping. All plants benefit from watering at the time of installation and immediately thereafter. Large trees may require watering during dry

periods for two years or more. But once established, native plants that are adapted to the regional and site conditions should be able to survive without supplemental watering and fertilizing. Maintenance can be further reduced by using a naturalistic or ecological-based planting scheme, where plants are massed in compatible groupings. Trees planted in groupings with understory plants or mulch beds will reduce the amount of mowing and trimming required. Landscapes of diverse trees and plants will also favor natural enemies to detrimental insects.

Cost

Landscaping with native plants will not be more expensive than landscaping with ornamental or exotic varieties. It is likely to be less expensive, particularly if native shrubs are substituted for exotic ones. Not only are deciduous plants less expensive than most ornamental evergreen shrubs, a deciduous plant is typically larger than a comparably priced evergreen shrub. When the leaves of a deciduous shrub drop in the fall, they add a natural mulch for that plant. Less watering and mulching may be needed. Native trees may be less expensive than named cultivars selected for their ornamental characteristics. Initially, a conventional plan that calls for trees in grass may be less expensive than an ecosystem planting that calls for a shrub or groundcover understory. However, in the long-run, maintenance costs may be lower for multilayered plantings. In addition, this type of multilayered planting may be developed as part of a forest conservation plan and thus be absorbed into the budget allocated to satisfy requirements of the Forest Conservation Act.

Student Participation

Initial school construction usually includes the design and installation of major tree and shrub masses and some landscape design associated with key site areas such as building entrances. The planning committee for a school construction project (see Chapter 2) will provide input into these landscaping decisions. Typically, however, school administrators, parent-teacher associations, community groups, and students continue the interest in planting efforts after the school has been occupied. Once the school becomes their own, students can participate in any phase of native plant landscaping from planning and design to installation and maintenance. The first step in the process might be an inventory of existing plants and plant communities on the site. By conducting a plant inventory, students can learn about plant and wildlife habitats on the school grounds. As a result, school groups may decide to undertake the creation of a meadow, wetland, or other site development option discussed in this manual. Students can develop schoolyard habitat projects, or they can enhance existing plantings by adding native ornamental shrubs and flowers to special schoolyard areas such as entrances, courtyards, or playgrounds. Projects such as adding perennial flower beds may require extra maintenance and should be undertaken only if school administrators and teachers support the effort, and if volunteers are willing to assume some responsibility for care. This care may involve weekly watering of flowers during periods of drought in the summer. By undertaking native plant landscaping projects, students learn about plant science, gain new skills, make their school more attractive, and come to understand how their actions can improve the environment.